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Exercise - I (Conceptual Questions) Build Up Your Understanding

AXIAL SKELETON

1. Cranium of human is made up of -
(1) 8 bones (2) 12 bones
(3) 16 bones (4) 14 bones

2. The number of floating ribs and true ribs in human body -
(1) 6 pairs, 8 pairs
(2) 5 pairs, 4 pairs
(3) 3 pairs, 2 pairs
(4) 2 pairs, 7 pairs

3. How many bones are present in human skull skeleton?
(1) 22 (2) 29 (3) 12 (4) 42

4. Number of cervical and thoracic vertebrae in human are
(1) 7, 12 (2) 7, 10 (3) 7, 11 (4) 7, 14

5. Body of vertebrae is called
(1) Centrum (2) Process
(3) Center (4) Spine

6. Cranial bone related to ear is
(1) Occipital (2) Frontal
(3) Nasal (4) Temporal

7. These facial bones are unpaired
(1) Lacrimal, Vomer
(2) Vomer, Mandible
(3) Nasal, Vomer
(4) Palatine, Mandible

8. In human beings the cranium is formed by
(1) Ten bones of which two are paired
(2) Eight bones of which two are paired
(3) Fourteen bones of which six are paired
(4) Twelve bones of which four are paired

9. Which of the following is wrong statement about hyoid bone?
(1) one in number
(2) U-shaped
(3) Not attached with any other bone of the body
(4) Present at the top of the buccal cavity

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10. Largest, Heaviest mammalian vertebra is :-
(1) Thoracic (2) Sacral
(3) Lumbar (4) Cervical

11. Which one of the following is the *correct description* of a certain part of a normal human skeleton ?
(1) First vertebra is axis which articulates with the occipital condyles.
(2) The 9th and 10th pairs of ribs are called the floating ribs.
(3) Glenoid cavity is a depression to which the thigh bone articulates.
(4) Parietal bone and the temporal bone of the skull are joined by fibrous joint.

12. Which of the following vertebrae are fused?
(1) Cervical, Thoracic
(2) Cervical, Sacrum
(3) Sacrum, Coccyx
(4) Thoracic, coccyx

13. The increase in vertebrae size from the neck to the lower back is due to :-
(1) Supporting more weight in the lower back than in the neck.
(2) Supporting less weight in the lower back than in the neck.
(3) Evolution
(4) Vertebrae don't increase in size.

14. Symphysis is made of :-
(1) fibrocartilage
(2) synovial fluid
(3) elastic cartilage
(4) hyaline cartilage

APPENDICULAR SKELETON

15. Part of pectoral girdle is:-
(1) Ileum (2) Glenoid cavity
(3) Acetabulum (4) Sternum

16. Scapula and clavicle form
(1) Pelvic girdle (2) Pectoral girdle
(3) Skull (4) Vertebral column

17. Pectoral girdle, pelvic girdle and limb bones constitute :
(1) Visceral skeleton
(2) Outer skeleton
(3) Axial skeleton
(4) Appendicular skeleton

18. Glenoid cavity is found in :
(1) Pelvic girdle (2) Skull
(3) Pectoral girdle (4) Sternum

19. Acromion process is part of :
(1) Vertebral column (2) Pelvic girdle
(3) Femur (4) Pectoral girdle

20. Pelvic girdle consists of :
(1) Ilium
(2) Ilium and ischium
(3) Ilium, ischium and pubis
(4) Ischium and pubis

21. Which of the following is a sesamoid bone?
(1) Pelvic (2) Patella
(3) Axis (4) Pectoral girdle

22. Number of bones in thumb of right forelimb of man are
(1) 5 (2) 4 (3) 3 (4) 2

23. The clavicle articulates with _____ of scapula
(1) Acromion process
(2) Glenoid cavity
(3) Acetabulum cavity
(4) Ball and socket joint

24. Which one is a flat bone ?
(1) Scapula (2) Carpal
(3) Patella (4) Tarsals

25. Digital formula of foot of Human is :-
(1) 03332 (2) 03333
(3) 03322 (4) 23333

26. Presence of obturator foramen is feature of:-
(1) Pectoral girdle (2) Vertebrae
(3) Pelvic girdle (4) Occipital bone

27. The other name for knee cap is
(1) Clavicle (2) Patella
(3) Radius (4) Femur

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28. An acromian process is characteristically found in the:-
(1) Pectoral girdle of mammals
(2) Sperm of mammals
(3) Pelvic girdle of mammals
(4) Skull of frog

JOINTS AND DISORDERS

29. Study of joints known as:-
(1) Osteology (2) Arthrology
(3) Craniology (4) Kinesiology

30. Saddle joint occurs between
(1) Carpal and first metacarpal of thumb
(2) Femur and pelvic girdle
(3) All the vertebrae
(4) Phalanges

31. Joints between phalanges are
(1) Ball and socket joints
(2) Gliding joints
(3) Hinge joints
(4) Pivot joints

32. It is an outcome of irregularities in metabolism of nitrogenous waste
(1) Osteoporosis
(2) Osteo-arthritis
(3) Gouty arthritis
(4) Rheumatoid arthritis

33. Which of the following is correct for the given assertion (A) and reason (R)?
Assertion (A) : Knee joint is hinge joint type joint.
Reason (R) : Femur , patella and fibula are associated with knee joint.
(1) Both (A) and (R) are true but (R) is the correct explanation of (A)
(2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
(3) (A) is true statement but (R) is false.
(4) Both (A) and (R) are false

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34. Synovial fluid is secreted by :
(1) Blood
(2) Cartilage
(3) Bone
(4) Synovial membrane

35. A joint between humerus and radio ulna is :-
(1) Ball & socket (2) Pivot
(3) Gliding (4) Hinge

36. The number of saddle joints in human beings is-
(1) 4 (2) 8
(3) 2 (4) 10

EXERCISE-I (Conceptual Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	1	4	2	1	1	4	2	2	4	3	4	3	1	1	2
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	2	4	3	4	3	2	4	1	1	4	3	2	1	2	1
Question	31	32	33	34	35	36									
Answer	3	3	3	4	4	3									

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Exercise - II (Previous Year Questions) AIPMT/NEET

AIPMT 2008

1. Which one of the following items gives its *correct total* number?
(1) Types of diabetes – 3
(2) Cervical vertebrae in humans – 8
(3) Floating ribs in humans – 4
(4) Amino acids found in proteins – 16

AIPMT 2009

2. Elbow joint is an example of :-
(1) Ball and socket joint
(2) Pivot joint
(3) Hinge joint
(4) Gliding joint

AIPMT 2011

3. Three of the following pairs of human skeletal parts are correctly matched with their respective inclusive skeletal category and one pair is not matched. Identify the nonmatching pair :-

Pair of skeletal parts	Category
(1) Malleus and stapes	Ear ossicles
(2) Sternum and ribs	Axial skeleton
(3) Clavicle and glenoid cavity	Pelvic girdle
(4) Humerus and ulna	Appendicular skeleton

Pre-AIPMT 2012

4. Select the correct statement regarding the specific disorder of muscular or skeletal system-
(1) Myasthenia gravis – Auto immune disorder which inhibits sliding of myosin filaments.
(2) Gout – inflammation of joints due to extra deposition of calcium.
(3) Muscular dystrophy – age related shortening of muscles.
(4) Osteoporosis-decrease in bone mass and higher chances of fractures with advancing age.

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NEET-UG 2013

5. Select the correct statement with respect to locomotion in humans :-
(1) The joint between adjacent vertebrae is a fibrous joint.
(2) A decreased level of progesterone causes osteoporosis in old people.
(3) Accumulation of uric acid crystals in joints causes their inflammation.
(4) The vertebral column has 10 thoracic vertebrae.

AIPMT 2014

6. Select the correct matching of the type of the joint with the example in human skeletal system :-

	Type of Joint	Example
(1)	Cartilaginous joint	Between frontal and parietal
(2)	Pivot joint	Between third and fourth cervical vertebrae
(3)	Hinge joint	Between humerus and pectoral girdle
(4)	Gliding joint	Between carpals

AIPMT 2015

7. Glenoid cavity articulates :-
(1) Scapula with acromion
(2) Clavicle with scapula
(3) Humerus with scapula
(4) Clavicle with acromion

Re-AIPMT 2015

8. Which of the following is not a function of the skeletal system?
(1) Locomotion
(2) Production of erythrocytes
(3) Storage of minerals
(4) Production of body heat

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9. Which of the following joints would allow no movement?
(1) Ball and Socket joint
(2) Fibrous joint
(3) Cartilaginous joint
(4) Synovial joint

NEET-II 2016

10. Osteoporosis, an age–related disease of skeletal system, may occur due to :-
(1) Decreased level of estrogen
(2) Accumulation of uric acid leading to inflammation of joints.
(3) Immune disorder affecting neuro–muscular junction leading to fatigue.
(4) High concentration of Ca^{++} and Na^{+}.

NEET-UG 2017

11. Out of 'X' pairs of ribs in humans only 'Y' pairs are true ribs. Select the option that correctly represents values of X and Y and provides their explanation :-
(1) X = 12, Y = 5 True ribs are attached dorsally to vertebral column and sternum on the two ends.
(2) X = 24, Y = 7 True ribs are dorsally attached to vertebral column but are free on ventral side.
(3) X = 24, Y = 12 True ribs are dorsally attached to vertebral column but are free on ventral side.
(4) X = 12, Y = 7 True ribs are attached dorsally to vertebral column and ventrally to the sternum.

12. The pivot joint between atlas and axis is a type of :-
(1) Cartilaginous joint
(2) Synovial joint
(3) Saddle joint
(4) Fibrous joint

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NEET-UG 2019

13. Select the correct option .
(1) 8^{th}, 9^{th} and 10^{th} pairs of ribs articulate directly with the sternum.
(2) 11^{th} and 12^{th} pairs of ribs are connected to the sternum with the help of hyaline cartilage.
(3) Each rib is a flat thin bone and all the ribs are connected dorsally to the thoracic vertebrae and ventrally to the sternum.
(4) There are seven pairs of vertebrosternal, three pairs of vertebrochondral and two pairs of vertebral ribs.

NEET-UG 2019 (Odisha)

14. Match the following joints with the bones involved:-

Column - I	**Column - II**
(a) Gliding joint	(i) Between carpal and metacarpal of thumb
(b) Hinge joint	(ii) Between Atlas and Axis
(c) Pivot joint	(iii) Between the carpals
(d) Saddle joint	(iv) Between Humerus and Ulna.

Select the correct option from the following :-
(1) (a)-(iii), (b)-(iv), (c)-(ii), d-(i)
(2) (a)-(iv), (b)-(i), (c)-(ii), d-(iii)
(3) (a)-(iv), (b)-(ii), (c)-(iii), d-(i)
(4) (a)-(i), (b)-(iii), (c)-(ii), d-(iv)

NEET-UG 2020

15. Match the following columns and select the correct option

Column - I	**Column - II**
(a) Gout	(i) Decreased levels of estrogen.
(b) Osteoporosis	(ii) Low Ca^{++} ions in the blood.
(c) Tetany	(iii) Accumulation of uric acid crystals.
(d) Muscular dystrophy	(iv) Auto immune dystrophy disorder.
	(v) Genetic disorder

(1) (a)-(ii), (b)-(i), (c)-(iii), (d)-(iv)
(2) (a)-(iii), (b)-(i), (c)-(ii), (d)-(v)
(3) (a)-(iv), .(b)-(v), (c)-(i), (d)-(ii)
(4) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

16. Match the following columns and select the correct option

Column - I	**Column - II**
(a) Floating Ribs	(i) Located between second and seventh ribs
(b) Acromion	(ii) Head of the Humerus
(c) Scapula	(iii) Clavicle
(d) Glenoid cavity	(iv) Do not connect with the sternum

	(a)	**(b)**	**(c)**	**(d)**
(1)	(iv)	(iii)	(i)	(ii)
(2)	(ii)	(iv)	(i)	(iii)
(3)	(i)	(iii)	(ii)	(iv)
(4)	(iii)	(ii)	(iv)	(i)

NEET-UG 2021

17. Match list - I with list – II

List I		**List II**	
(a)	Scapula	(i)	Cartilaginous bone
(b)	Cranium	(ii)	Flat bone
(c)	Sternum	(iii)	Fibrous bone
(d)	Vertebral column	(iv)	Triangular flat bone

Choose the correct answer from the options given below

	(a)	**(b)**	**(c)**	**(d)**
(1)	(i)	(iii)	(ii)	(iv)
(2)	(ii)	(iii)	(iv)	(i)
(3)	(iv)	(ii)	(iii)	(i)
(4)	(iv)	(iii)	(ii)	(i)

NEET-UG 2022

18. Given below are two statements: one is labelled as :
Assertion (A) and the other is labelled as **Reason (R).**
Assertion (A): Osteoporosis is characterised by decreased bone mass and increased chances of fractures.
Reason (R): Common cause of osteoporosis is increased levels of estrogen.
In the light of the above statements, choose the **most appropriate** answer from the options given below:
(1) Both **(A)** and **(R)** are correct but **(R)** is not the correct explanation of **(A)**
(2) **(A)** is correct but **(R)** is not correct
(3) **(A)** is not correct but **(R)** is correct
(4) Both **(A)** and **(R)** are correct and **(R)** is the correct explanation of **(A)**

Exercise - II (Previous Year Questions) ANSWER KEY

Question	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Answer	**3**	**3**	**3**	**4**	**3**	**4**	**3**	**4**	**2**	**1**	**4**	**2**	**4**	**1**	**2**
Question	**16**	**17**	**18**												
Answer	**1**	**4**	**2**												

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Exercise - III — Master Your Understanding

EXERCISE-III (A) (NCERT Based QUESTIONS)

1. Match the columns and pick out the correct answer :-

Column-A	Column-B
(i) Atlas/axis	(a) Saddle joint
(ii) Carpal/metacarpal of thumb	(b) Hinge joint
(iii) Between phalanges	(c) Fibrous joint
(iv) Femur / acetabulum	(d) Ball and socket joint
(v) Between cranial bones	(e) Pivot joint

	(i)	(ii)	(iii)	(iv)	(v)
(1)	e	a	b	c	d
(2)	e	a	b	d	c
(3)	e	a	d	b	c
(4)	e	a	d	c	b

2. Joint between pubic bones in the pelvis girdle is-
(1) Cartilagenous joint
(2) Fibrous joint
(3) Hinge joint
(4) Ball and socket joint

3. 11th and 12th pairs of ribs are called
(1) True ribs
(2) False ribs
(3) Vertebrochondral ribs
(4) Floating ribs

4. The number of phalanges in both fore limbs of human is :-
(1) 14 (2) 28 (3) 12 (4) 24

5. Identify the correct and wrong statements :-
(a) Human skeleton has 206 bones
(b) There are 12 pairs of ribs in human
(c) Sternum is present on the dorsal side of the body.
(d) All mammals (except of few) have 8 cervical vertebrae.
(e) Ribs are bicephalic

correct	wrong
(1) a, b, c	d, e
(2) a, b, d	c, e
(3) a, b, e	c, d
(4) a, c, d	b, e

6. Which of the following is **wrong** match for each limb?
(1) Wrist bones → 8 in number
(2) Palm bones → 5 in number
(3) Ankle bones → 7 in number
(4) Digits → 12 in number

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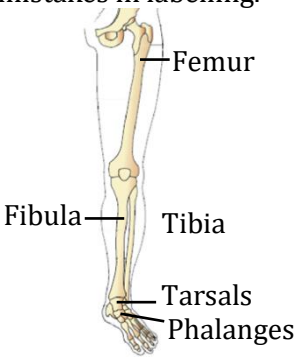
7. Each coxal bone is formed by fusion of three bones?
(1) Ilium, ischium, pubis
(2) Ilium, sacrum, pubis
(3) Ilium, sacrum, coccyx
(4) Ilium sacrum, ischium

8. Given below is a diagram of the bones of the left human hind limb as seen from front. It has certain mistakes in labelling.



Two of the wrongly labelled bones are :-
(1) Tibia and tarsals
(2) Femur and fibula
(3) Fibula and phalanges
(4) Tarsals and femur

9. This bone is a large triangular flat bone situated in the dorsal part of the thorax between the second and the seventh ribs. Identify this bone :-
(1) Femur (2) Hip bone
(3) Scapula (4) Sacrum

10. _____ are characterised by the presence of a fluid filled synovial cavity between the articulating surfaces of the two bones :-
(1) Fibrous joints
(2) Synovial joints
(3) Cartilagenous joints
(4) Hinge joints

11. Inflammation of joints due to accumulation of uric acid crystals is called :-
(1) Osteoporosis (2) Gout
(3) Arthritis (4) Tetany

12. ___ and ____ constitute our skeletal system.
(1) Bones and blood
(2) Blood and lymph
(3) Bones and cartilages
(4) Bones and nervous

13. Which of the following type of joint allows considerable movements and therefore, play a significant role in locomotion?
(1) Synovial joints (2) Fibrous joints
(3) Cartilagenous joints (4) All of the above

14. Match the columns

	Column-A	Column-B
(a)	Ribs	(i) 26
(b)	Vertebrae	(ii) 14
(c)	Phalanges	(iii) 1
(d)	Sternum	(iv) 24

	(a)	(b)	(c)	(d)
(1)	(iv)	(i)	(iii)	(ii)
(2)	(iv)	(iii)	(ii)	(i)
(3)	(iv)	(i)	(ii)	(iii)
(4)	(iv)	(iii)	(i)	(ii)

15. Match the List-1 with List-2 correct and find your answer from the code given below :-

	List-1	List-2
(i)	Palm bones	(A) 14 in number
(ii)	Wrist bones	(B) 5 in number
(iii)	Ankle bones	(C) 8 in number
(iv)	Phalanges	(D) 7 in number

Code :
(1) (i)-A (ii)-B (iii)-C (iv)-D
(2) (i)-B (ii)-C (iii)-D (iv)-A
(3) (i)-A (ii)-C (iii)-D (iv)-B
(4) (i)-C (ii)-D (iii)-B (iv)-A

16. Between humerus and pectoral girdle which type of joint is present :-
(1) Pivot joint (2) Hinge joint
(3) Ball & socket joints (4) Gliding joints

17. Find out incorrect statements :-
(1) Brain box is formed of 8 bones
(2) In skull the frontal bone is single
(3) A single U-shaped bone present at the base of the buccal cavity is quadrate
(4) Hyoid bone is the part of skull

EXERCISE-III(B) (ANALYTICAL QUESTIONS)

18. Pelvic girdle of man consists of :-
(1) Ilium, ischium and pubis
(2) Ilium, ischium and coracoid
(3) Coracoid, scapula and clavicle
(4) Ilium, coracoid and scapula

19. Hinge joint is present between :-
(1) Femur and ulna
(2) Humerus and ulna
(3) Femur and pectoral girdle
(4) Femur and pelvic girdle

20. Thoracic cage in Human is made up of :-
(1) Ribs, vertebral column and diaphragm
(2) Ribs, diaphragm
(3) Vertebral column, diaphragm and sternum
(4) Ribs, vertebral column and sternum

21. In which one of the following bones acromian process is found ?
(1) Femur (2) Coxal bones
(3) Atlas (4) Scapula

22. The number of floating ribs in human body
(1) 6 pairs (2) 5 pairs
(3) 3 pairs (4) 2 pairs

23. Axial skeletal is made up of
(1) Vertebral column complete
(2) Skull
(3) Sternum
(4) All of the above

24. The shoulder and hip joints are
(1) Pivot joint
(2) Hinge joint
(3) Ellipsoid joint
(4) Ball and socket joint

25. Bones become fragile in-
(1) Gout (2) Osteoporosis
(3) Arthritis (4) None of these

26. Part of mammalian body has single pairs of bones -
(1) Pelvic girdle (2) External ear
(3) Lower jaw (4) All of the above

Exercise - III ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	2	1	4	2	3	4	1	3	3	2	2	3	1	3	2
Question	16	17	18	19	20	21	22	23	24	25	26				
Answer	3	3	1	2	4	4	4	4	4	2	1				

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Exercise - I (Conceptual Questions) Build Up Your Understanding

INTRODUCTION, STRUCTURE OF MUSCLE

1. Epimysium of muscles are made up of :-
(1) White fibrous connective tissue
(2) Adipose connective tissue
(3) Reticular connective tissue
(4) Areolar connective tissue

2. Total No. of muscles in our body is :-
(1) 256 muscles (2) 639 muscles
(3) 400 muscles (4) 421 muscles

3. Strongest muscles :-
(1) Thigh muscle (2) Leg muscle
(3) Arm muscle (4) Jaw muscle

4. Muscles of Iris & Ciliary body originate :-
(1) Ectoderm (2) Mesoderm
(3) Endoderm (4) All of above

5. Striated muscle fibres found in :-
(1) Trachea (2) Lung
(3) Leg (4) Gall bladder

6. Smallest muscles in man :-
(1) Gluteus maximus (2) Stapedius
(3) Sartorius (4) Massetor

7. The type of muscles present in our :
(1) Upper arm are smooth muscle fibres fusiform in shape.
(2) Heart are involuntary and unstriated smooth muscles.
(3) Intestine are striated and involuntary.
(4) Thigh are striated and voluntary.

8. Which one of the following is *correct* pairing of a body part and the kind of muscle tissue that moves it ?
(1) Iris – Involuntary smooth muscle
(2) Heart wall – Involuntary unstriated muscle
(3) Biceps of upper arm – Smooth muscle fibres
(4) Abdominal wall – Cardiac muscle

9. One myosin filament in the myofibril of skeletal muscle fibre is surrounded by how many actin filaments ?
(1) Two (2) Four (3) Six (4) Three

10. Which character is not associated with red muscle fibres?
(1) High quantity of myoglobin is present
(2) Amount of mitochondria are more
(3) Amount of sacroplasmic reticulum is high
(4) Contraction is slow and for long duration

11. Ciliary movement occurs in most of our internal tubular organs which are lined by ...A... epithelium. The coordinated movement of cilia in the ...B... help us in removing dust particles.
Identify A and B complete the given statement.
(1) A–squamous, B–trachea
(2) A–cuboidal, B–trachea
(3) A–ciliated, B–trachea
(4) A–stratified, B–trachea

12. Skeletal muscles are closely associated with the ...A... components of the body. They have ...B... appearance under the microscope and hence are called ...C... muscles.
Choose the correct options to fill A, B and C, so as to complete the given statement.
(1) A–muscular, B–stripped, C–striated
(2) A–visceral, B–stripped, C–striated
(3) A–skeletal, B–stripped, C–striated
(4) A–microfibrillar, B–stripped, C–striated

MUSCLE PROTEIN, MUSCLE CONTRACTION

13. During contraction of muscles :-
(1) Actin Filament slide over actin
(2) Myosin filament slide over actin
(3) Actin filament slide over myosin
(4) Myosin filament slide over actin

14. Contractile unit of muscle fibres :-
(1) Muscle fibre (2) Sarcomere
(3) Myofibril (4) Sacosome

15. ATP-ase activity found in :-
(1) Myosin filament (2) Actin filament
(3) Both (4) Troponin

16. Chemical Ions responsible for muscles contraction :-
(1) Ca^{++} & K^{+} (2) Na^{+} & K^{+}
(3) Na^{+} & Ca^{++} (4) Ca^{++} & Mg^{++} Ions

17. Immediate source of energy for muscle contraction is:-
(1) Glucose (2) GTP
(3) ATP (4) Creatine phosphate

18. The muscle fatigue occurs due to accumulation of:-
(1) CO_2 (2) Lactic acid
(3) Creatine phosphate (4) Myosin ATPase

TG: @Chalnaayaaar

19. ...A... band contains actin and is called ...B... band, whereas the ...C... band called ...D... band contains myosin.
Choose the correct options for A, B, C and D to complete the given statement :-
(1) A–Light, B–I, C–dark, D–A
(2) A–Dark, B–I, C–light, D–A
(3) A–Dark, B–A, C–light, D–I
(4) A–Light, B–A, C–dark, D–I

20. In a ...A... state, the edge of thin filaments on either side of thick filaments ...B... overlap the free ends of ...C... filaments leaving the central part of thick filaments. This central part of thick filament, not overlapped by thin filaments is called ...D... zone.
Choose the correct options to fill the gaps A, B, C and D, so as to complete the given statement
(1) A–resting, B–partially, C–thick, D–H
(2) A–resting, B–partially, C–thick, D–A
(3) A–resting, B–partially, C–thick, D–I
(4) A–resting, B–partially, C–thick, D–M

INVOLUTARY, CARDIAC MUSCLES, DISORDERS

21. Functionally cardiac muscles are similar to-
(1) Unstriped muscles
(2) Striped muscles
(3) Striped & Unstriped muscles
(4) None

22. Mitochondria in cardiac muscles :-
(1) More than other muscles fibres
(2) Less than other muscles fibres
(3) Equal than other muscles fibres
(4) None

23. Unstriped muscle are also known as :-
(1) Visceral (2) Smooth
(3) Involuntary (4) All

24. Longest smooth muscles are :-
(1) Intestine
(2) Stomach
(3) Uterus (Pregnant)
(4) Urinary bladder

25. Cardiac muscles Fibres :-
(1) Involuntary (2) Non-fatigue
(3) Striated like (4) All

26. Smooth muscles fibres are :-
(1) Spindle shaped
(2) Unbranched & Involuntary
(3) Uninucleated
(4) All of above

27. Which filamentous proteins are found in muscle?
(1) Leucine & myosin protein
(2) Actin & myosin protein
(3) Actin & leucine protein
(4) Actin protein only

28. Motor-end plate is the junction between-
(1) actin and myosin filaments.
(2) two actin filaments.
(3) sensory neuron and the sarcolemma of the muscle fibre.
(4) motor neuron and the sarcolemma of the muscle fibre.

29. I. Sarcoplasmic reticulum are abundant.
II. Myoglobin content is high.
III. Sarcoplasmic reticulum are moderate.
IV. Aerobic muscles.
V. Depends on anaerobic respiration for energy.
VI. Less myoglobin content.
Select the option with correct statements for red muscle.
(1) I, II and IV (2) I, II and III
(3) II, III and IV (4) II and IV

EXERCISE-I (Conceptual Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	1	2	4	1	3	2	4	1	3	3	3	3	3	2	1
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
Answer	4	3	2	1	1	1	1	4	3	4	4	2	4	3	

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Exercise - II (Previous Year Questions) AIPMT/NEET

AIPMT Mains 2011

1. The type of muscles present in our :
(1) upper arm are smooth muscle fibres fusiform in shape.
(2) heart are involuntary and unstriated smooth muscles.
(3) intestine are striated and involuntary.
(4) thigh are striated and voluntary.

AIPMT Mains 2012

2. Which one of the following pairs of chemical substances, is correctly categorised ?
(1) Troponin and myosin – Complex proteins in striated muscles
(2) Secretin and rhodopsin – Polypeptide hormones
(3) Calcitonin and thymosin – Thyroid hormones
(4) Pepsin and prolactin – Two digestive enzymes secreted in stomach

NEET-UG 2013

3. The H-zone in the skeletal muscle fibre is due to:
(1) extension of myosin filaments in the central portion of the A-band
(2) the absence of myofibrils in the central portion of A-band
(3) the central gap between myosin filaments in the A-band
(4) the central gap between actin filaments extending through myosin filaments in the A-band

AIPMT 2014

4. Stimulation of a muscle fiber by a motor neuron occurs at :
(1) the neuromuscular junction
(2) the transverse tubules
(3) the myofibril
(4) the sacroplasmic reticulum

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AIPMT 2015

5. Sliding filament theory can be best explained as :-
(1) Actin and Myosin filaments shorten and slide pass each other
(2) Actin and Myosin filaments do not shorten but rather slide pass each other
(3) When myofilaments slide pass each other, Myosin filaments shorten while Actin filaments do not shorten
(4) When myofilaments slide pass each other Actin filaments shorten while Myosin filament do not shorten

NEET-I 2016

6. Lack of relaxation between successive stimuli in sustained muscle contraction is known as:-
(1) Spasm (2) Fatigue
(3) Tetanus (4) Tonus

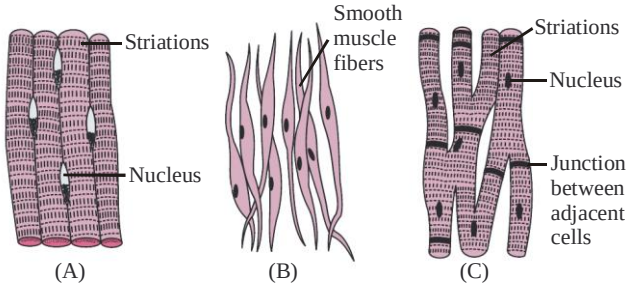
NEET-II 2016

7. Smooth muscles are :-
(1) Involuntary, cylindrical, striated
(2) Voluntary, spindle–shaped, uninucleate
(3) Involuntary, fusiform, non-striated
(4) Voluntary, multinucleate, cylindrical

8. Name the ion responsible for unmasking of active sites for myosin for cross–bridge activity during muscle contraction.
(1) Sodium (2) Potassium
(3) Calcium (4) Magnesium

NEET-UG 2017

9. Select the **correct** match :-



(1) A-Skeletal muscles → biceps, striated muscles, involuntary
(2) B-Smooth muscles → walls of stomach, voluntary
(3) C-Cardiac muscles → heart, dorsal wall of aorta, voluntary
(4) A-Skeletal muscle → biceps, striated, voluntary

NEET-UG 2018

10. Calcium is important in skeletal muscle contraction because it :-
(1) binds to troponin to remove the masking of active sites on actin for myosin.
(2) activates the myosin ATPase by binding to it.
(3) detaches the myosin head from the actin filament.
(4) prevents the formation of bonds between the myosin cross bridges and the actin filament.

NEET-UG 2019 (Odisha)

11. Which of the following diseases is an autoimmune disorder?
(1) Myasthenia gravis (2) Arthritis
(3) Osteoporosis (4) Gout

NEET-UG 2019

12. Which of the following muscular disorders is inherited?
(1) Tetany
(2) Muscular dystrophy
(3) Myasthenia gravis
(4) Botulism

13. Chronic autoimmune disorder affecting neuro muscular junction leading to fatigue, weakening and paralysis of skeletal muscle is called as
(1) Arthritis
(2) Muscular dystrophy
(3) Myasthenia gravis
(4) Gout

14. Match the following columns and select the correct option

Column - I	Column - II
(a) Gout	(i) Decreased levels of estrogen
(b) Osteoporosis	(ii) Low Ca^{++} ions in the blood
(c) Tetany	(iii) Accumulation of uric acid crystals
(d) Muscular dystrophy	(iv) Auto immune disorder
	(v) Genetic disorder

(1) (a)-(ii), (b)-(i), (c)-(iii), (d)-(iv)
(2) (a)-(iii), (b)-(i), (c)-(ii), (d)-(v)
(3) (a)-(iv), (b)-(v), (c)-(i), (d)-(ii)
(4) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

NEET-UG 2021

15. Which of the following statements wrongly represents the nature of smooth muscle?
(1) These muscle have no striations
(2) They are involuntary muscles
(3) Communication among the cells is performed by intercalated discs
(4) These muscles are present in the wall of blood vessels

16. During muscular contraction which of the following events occur ?
(a) 'H' zone disappears
(b) 'A' band widens
(c) 'I' band reduces in width
(d) Myosin hydrolyzes ATP, releasing the ADP and Pi
(e) Z-lines attached to actins are pulled inwards
Choose the **correct** answer from the options given below.
(1) (a), (c), (d), (e) only
(2) (a), (b), (c), (d) only
(3) (b), (c), (d), (e) only
(4) (b), (d), (e), (a) only

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NEET-UG 2022

17. Which of the following is a **correct** match for disease and its symptoms ?

(1) Tetany - high Ca^{2+} level causing rapid spasms.

(2) Myasthenia gravis - Genetic disorder resulting in weakening and paralysis of skeletal muscle

(3) Muscular dystrophy - An auto immune disorder causing progressive degeneration of skeletal muscle

(4) Arthritis - Inflammed joints

Re-NEET-UG 2022

18. According to the sliding filament theory:

(1) Actin and myosin filaments slide over each other to increase the length of the sarcomere.

(2) Length of A–band does not change.

(3) I–band increases in length

(4) The actin filaments slide away from A–band resulting in shortening of sarcomere.

Exercise - II (Previous Year Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	4	1	4	1	2	3	3	3	4	1	1	2	3	2	3
Question	16	17	18												
Answer	1	4	2												

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Exercise - III Master Your Understanding

EXERCISE-III (A) (NCERT Based QUESTIONS)

1. In a muscle fibre Ca^{++} is stored in :-
(1) Sarcoplasmic reticulum
(2) Sarcosome
(3) Sarcomere
(4) Sarcolemma

2. Cardiac muscles are :-
(1) Striated, voluntary
(2) Striated, involuntary
(3) Unstriated, voluntary
(4) Unstriated, involuntary

3. Ciliary movement is found in:
(1) Macrophages and leucocytes
(2) Fallopian tube and vasa deferentia
(3) Fallopian tube and Trachea
(4) Tongue and Limbs

4. Amoeboid movement is found in :-
(1) Limbs, Jaw
(2) Macrophages, Leucocytes
(3) Trachea, Fallopian tube
(4) Tongue, Leucocytes

5. In the center of I-Band, is an elastic fiber, which bisect it
(1) 'H'-zone (2) 'M'-line
(3) 'Z' line (4) A-band

6. Motor neuron along with muscle fibers are connected & constitute a :-
(1) Neuro muscular junction
(2) Motor end plate
(3) Motor unit
(4) Both (1) & (2)

7. Myosin head contains :-
(1) ATPase
(2) ATP binding sites
(3) Active sites for actin
(4) All of these

8. Which points are correct for cardiac muscles?
(A) They are striated
(B) They are unbranched
(C) They are involuntary
(D) Intercalated disc are present
(1) A, B, C (2) B, C, D
(3) A, C, D (4) A, B, D

9. In *Paramoecium*, the movement of food through cytopharynx take place by :-
(1) Cilia (2) Flagella
(3) Microvilli (4) Myonemes

10. The striated appearance of the myofibril is due to the distribution pattern of :-
(1) Actin (2) Myosin
(3) Calmodulin (4) Both (1) and (2)

11. Repeated activation of the muscles can lead to the accumulation of :-
(1) Acetic acid (2) Acetyl choline
(3) Lactic acid (4) Lactose

12. Muscles contains a red coloured oxygen storing pigment called :-
(1) Haemoglobin (2) Sarcosome
(3) Myoglobin (4) Hemerythrins

EXERCISE-III(B) (ANALYTICAL QUESTIONS)

13. In a resting state, the central part of thick filament which is not overlapped by thin filament is called :-
(1) A-band (2) M-line
(3) H-zone (4) I-band

14. During contraction of muscle :
(1) Thin filaments slides over the thick filaments.
(2) Thick filament slides over the thin filaments
(3) Both filaments slide over each other.
(4) No filament slides during contraction.

15. Which points are correct with the regarding of skeletal muscles?
(A) Their activities are under the voluntary control of the nervous system.
(B) They are located in the inner walls of visceral organs.
(C) They are primarily involved in locomotary actions and changes of body postures.
(D) They have no striped appearance
(1) B, D (2) B, C
(3) A, D (4) A, C

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16. Which points are correct about visceral muscles?
(1) These are located in the inner walls of hollow visceral organs of the body.
(2) They do not exhibit any striations.
(3) Their activities are not under the voluntary control of the nervous system.
(4) All of the above

17. Correctly match column-I with column-II.

Column-I	Column-II
(A) Tetany	(i) Auto immune disorder.
(B) Osteoporosis	(ii) Progressive degeneration of skeletal muscle.
(C) Muscular dystrophy	(iii) Inflammation of joints.
(D) Arthritis	(iv) Rapid spasms in muscle.
(E) Myasthenia Gravis	(v) Bone mass decreased.

(1) A→(i), B→(ii), C→(iii), D→(iv), E→(v)
(2) A→(iv), B→(v), C→(i), D→(iii), E→(ii)
(3) A→(iv), B→(v), C→(ii), D→(iii), E→(i)
(4) A→(ii), B→(iii), C→(i), D→(v), E→(iv)

18. The functional unit of contraction is :-
(1) Muscle fibre (2) Sarcomere
(3) Sarosomes (4) Sarcoplasm

19. The correct sequence of events during relaxation of muscle is :-
(i) Inactivation of the actin
(ii) Ca^{++} returned to SR
(iii) Cross bridges are broken
(1) (i), (ii), (iii) (2) (ii), (i), (iii)
(3) (ii), (iii), (i) (4) (iii), (ii), (i)

20. Striated muscles are primarily involved in
(A) Locomotary actions
(B) Changes in body postures
(C) Transportation of food through digestive tract
(D) Transportation of gametes through genital tract
(1) A, B (2) B, C (3) C, D (4) A, D

21. Which character is/are associated with locomotion?
(A) All locomotion are movements
(B) All movements are not locomotions
(C) Methods of locomotion vary with animals habitats
(D) Locomotion is also for escape from predators
(1) A and B
(2) B, C and D
(3) A, B and C
(4) A, B, C and D

22. The thick filaments in 'A' band are held together in the middle of this band by a thin membrane called
(1) Z-line (2) M-line
(3) H-line (4) O-line

23. A neural signal reaching neuromuscular junction releases a neurotransmitter namely-
(1) Dopamine
(2) Acetylcholine
(3) GABA
(4) Glycine

24. Given below are two statements –
Statement I : All locomotion are movement but all movements are not locomotion.
Statement II : Walking, running, climbing and swimming such types of voluntary movements are called locomotion.
In the light of above statements, choose the correct answer from the option given below.
(1) Both statement – I and statement – II are incorrect.
(2) Statement – I is correct but statement – II is incorrect.
(3) Statement–I is incorrect but statement–II is correct.
(4) Both statement – I and statement – II are correct.

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25. Given below are two statements –

Statement I : Each myofibril has alternate dark and light band on it.

Statement II : Myosin filaments are thinner as compared to the actin filaments.

In the light of the above statements, choose the correct answer from the option given below.

(1) Both statement – I and statement – II are incorrect.

(2) Statement – I is correct but statement – II is incorrect.

(3) Statement–I is incorrect but statement–II is correct.

(4) Both statement – I and statement – II are correct.

26. Given below are two statements. One is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A) : Increase Ca^{+2} level leads to the binding of calcium with a subunit of troponin on actin filaments.

Reason (R) : Action potential spreads through the muscle fibre and causes the release of calcium ion into the sarcoplasm.

In the light of the above statements, choose the correct answer from the option given below.

(1) Both (A) and (R) are correct but (R) is not the correct explanation of (A).

(2) (A) is correct but (R) is not correct.

(3) (A) is not correct but (R) is correct.

(4) Both (A) and (R) are correct and (R) is the correct explanation of (A)

Exercise - III ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	1	2	3	2	3	3	4	3	1	4	3	3	3	1	4
Question	16	17	18	19	20	21	22	23	24	25	26				
Answer	4	3	2	2	1	4	2	2	4	2	1				